REMARKS

Examiner has rejected Claims 17-21 under 35 U.S.C. § 103(a) as being unpatentable over *Choi* (US 6,275,741) "in view of admitted Prior Art." In response thereto and to further clarify Applicant's invention, Applicant has amended Claims 17-21 to more succinctly claim and distinguish Applicant's device and respectfully traverses Examiner's rejections with respect to the specific embodiments of Applicant's device as claimed herein.

With respect to the specific embodiments described by Applicant in the pending claims of this present application, the novel improvement taught by the integration of the sensory controller and the machine controller in Applicant's device is distinct from the improvement offered by the integrated control platform of *Choi* ('741), wherein the focus of the *Choi* ('741) patent was to "obviate the need for the analog signal processor and the programmable logic controller used in the prior art." (Col. 1, lines 12-14). Applicant notes that *Choi* ('741) incorporates U.S. Pat. No. 5,062,052 by reference and distinguishes same by noting that "although *Sparer, et al.* ('052) discloses a general purpose computer for an injection molding system, its use is restricted to interfacing between the PLC [programmable logic controller] and the HMI [human machine interface]." With respect to that human operator interfacing, *Sparer, et al.* ('052) states "The

requirements of real time machine and process control and those of effective operator interface and process analysis are different." Col. 2, lines 33-36. That is, *Sparer, et al.* ('052) was directed toward a computer linking a programmable logic controller with an operator station in order to provide "direct programmed control in real time of the machine specific functions of the process and direct manual control in real time of certain machine functions." Col. 4, lines 20-26. *Choi* ('741), on the other hand, was directed toward a computer "coupled to both the operator control panel and the plurality of injection molding devices," to alleviate the "need for the analog signal processor and the programmable logic controller of the prior art." Therefore, again noting the statement from *Sparer, et al.* ('052), and by specific incorporation, from *Choi* ('741), that "The requirements of real time machine and process control and those of effective operator interface and process analysis are different," it is clear that *Choi* ('741) is directed toward streamlining the operator interface by eliminating the programmable logic controller intermediary, and that Applicant's invention is different. That is, unlike *Choi* ('741), Applicant's invention is directed toward directly improving real time machine and process control, not indirect improvement via operator interface effectiveness.

Thus, although *Choi* ('741) discloses a general purpose computer for an injection molding system, its use is restricted by

its reliance on operator input from a human machine interface, **requiring** "human machine interface (HMI)… for the operation and monitoring of the injection molding system." (Col. 4, lines 13-15) The crux of Applicant's invention lies in the integrated controller for the machine and the sensory devices, whereby Applicant's novel integrated controller "can receive the input signal(s)/data from the sensory device, analyze the data, provide an output signal to the sensory device and communicate **directly** and **contemporaneously** with the machine controller software" (abstract, and p.12, lines 3-7) **without necessitating any human interaction, operation or monitoring.** This is very distinct from *Choi* ('741), wherein the self-described "method of controlling an injection molding machine" includes "inputting to a single processor the feedback signals **and signals from the operator input**…" and "using the single processor to control, in real-time, both the plurality of injection molding devices and the control panel display." Col. 3, lines 29-34.

The method of Applicant's device **does not require** signals from an operator, although a user interface is provided to enable direct control, such as for in an emergency situation, or initial setup. Applicant's invention is not directed toward alleviating a need for an analog signal processor and a programmable logic controller, although the Applicant's integrated controller does coincidently alleviate such need. Unlike any system suggested or described

previously, Applicant's invention alleviates the requirement for separate controllers "to receive input signals, provide data comparison and/or determine sensory parameters" and enables the generation of an automated "output signal to the sensory device and/or to the molding machine controller". Page 9, lines 14-18. As noted in Applicant's disclosure, "with prior systems, the machine controller polls data input/output from the sensor controller and then waits for the data. In extremely time sensitive automatic cycling systems such as injection molding machines, even slight delays can affect the overall efficiency of the system and result in substantial increase in the cost of goods." Pages 10-11, line 22. The human operator of *Choi* ('741) must "input control data" and "view process feedback information," (Col. 4, lines 59-60) wherein Applicant's integrated controller self-analyzes "process feedback information" and directly controls actions as a result of such analysis via the automated output signal. There can be no question that Applicant's integrated controller provides significant improvement over the human interface reliant system of *Choi* ('741).

Further, Examiner states that *Choi* ('741) discloses "...sensory electronics in communication with said data interface of said computer, said sensory electronics outputting sensory data to said computer via said data interface (Fig. 4, elements 406, 24, 44)..." The sensory electronics of Applicant's device are distinct from the

cited "sensory electronics," element 406, of *Choi* ('741). Element 406 of *Choi* ('741) is "feedback sensors associated with the machine elements" to "provide digital and analog feedback signals..." (Col. 10, lines 18-20) The machine elements are described by *Choi* ('741) as "digital devices and analog devices" utilized to carry out injection molding processes "in a well-known manner." (Col. 4, lines 43-45) Applicant's sensory electronics are distinct from these digital and analog devices and are central to Applicant's invention. *Choi* ('741), however, fails to offer specific description or functionality of these machine elements, and never speaks to any focus on improving the ejection sequence or on enabling quality control inspection. That is, *Choi* ('741) merely offers background examples of analog devices, "extruder drives, proportional flow control valves, electric drives, heating and cooling elements, and other electro-hydro-mechanical drives," and of digital devices, "proximity switches, clamp pressure limit transducers, digital solenoid valves." (Col. 1, lines 23-29) Thus, the "feedback sensors" of *Choi* ('741) are simple signals generally relating to the functionality of operative machine elements. Unlike Applicant's sensory electronics, the simple "feedback sensors" of *Choi* ('741) fail to offer any data suitable for further analysis, capable of forming a basis for improving throughput, or capable of providing a foundation for part quality inspection. Moreover, there is no suggestion by *Choi* ('741) of any consideration along those lines. *Choi* ('741) only offers a static

system improvement by eliminating the need for programmable logic controller. Applicant's system improvement is not static, but is dynamic. That is, Applicant's integrated sensory electronics automatically, and essentially continually, assess the system status and make adjustments to ejection parameters on an ongoing basis, maximizing throughput without requiring inherently limited human input to accomplish such adjustments. Further, Applicant's integrated sensory electronics enable automated quality control inspection capabilities for real time assessment of part quality, measurement and/or sorting of parts. Thus, Applicant respectfully asserts that *Choi* ('741) does not disclose sensory electronics, as stated by Examiner.

Examiner stated that because Applicant reported that technologies, such as light beam sensors, vision systems, air pressure systems, vacuum sensors, and others, have been used to sense or determine whether the parts have been ejected from the molds, that "it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of *Choi* and include such sensors." However, Applicant's novel integrated controller enables a closer coupling of the ejection analysis result and the molding process, as well as a closer coupling of a quality control inspection/part verification station and the molding process, thereby reducing the number of defective parts produced and causing the continuation of the

molding cycle to be more seamlessly efficient than any previously reported systems. Moreover, as detailed hereinabove, the feedback sensors of *Choi* ('741) are dissimilar to the sensors of Applicant's invention. The teaching of *Choi* ('741) does not suggest any anticipation of utilizing automated sensory data acquisition for machine control. That is, even if the prior art sensors reported by Examiner were combined with *Choi* ('741), one would not arrive at or anticipate Applicant's invention. At most, one could arrive at a machine system that was capable of assessing the status of the part/mold and signaling that status to a human machine interface, wherein an operator could input a change to the system. This clearly does not teach, describe or anticipate Applicant's invention.

Applicant's sensory electronics are integrated means for eliciting real-time data regarding the status of the formed product relative to the part-forming mold in order to dynamically and automatically affect the functionality of, and increase the quality and productivity of, the part-forming process. Applicant respectfully notes that all the claim limitations must be taught/found in the prior art. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). *Choi* ('741) does not teach or anticipate an integrated controller capable of directly acquiring and analyzing sensory data and for utilizing said data for controlling a part-forming machine without requiring input from a

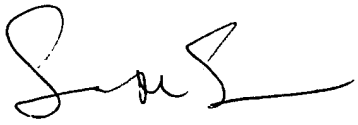
user interface; functional communications in *Choi* ('741) do not occur independently of input from a user interface. In light of Applicant's present amendment to clarify that user input is not necessary for a functional control response by the machine, Applicant respectfully asserts that all the claim limitations of Applicant's invention are not found in the prior art.

It is well recognized that the field of Applicant's invention is crowded, and that seemingly small improvements can provide incredible rewards in productivity. The *Choi* ('741) patent admits the minute difference between the device thereof and the device of *Sparer et al.* ('052), however, recognizes that such a minute difference can have tremendous economic impact, especially with regards to part-molding processing. With respect to the specific embodiments claimed herein, Applicant's improvement over *Choi* ('741) could be analogously considered. Applicant respectfully asserts that the heretofore unrealized and unexpected benefit of Applicant's integrated controller, that is, the improvement provided by the novel combination of machine controller and sensory controller as defined by Applicant, enables a contemporaneous functional response, without polling, without waiting for input from a human machine interface, and without wasting precious seconds or fractions of seconds, thereby resulting in a truly measurable, continuously and automatically dynamic maximization of process efficiency.

CONCLUSION

The above-made amendments are to form only and thus, no new matter was added. Applicant respectfully believes that, based upon the forgoing, the Claims and application in condition for allowance. Should the Examiner have any further questions and/or comments, Examiner is invited to telephone Applicant's undersigned Attorney at the number below.

Respectfully submitted, this 11th day of February, 2004.



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